



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,696	07/24/2002	Yukoh Iiei	0760-0304P	5503
2292 7590 09/14/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
HWU, JUNE				
ART UNIT		PAPER NUMBER		
1661				
NOTIFICATION DATE		DELIVERY MODE		
09/14/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/089,696

Applicant(s)

HIEI ET AL.

Examiner

JUNE HWU

Art Unit

1661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 12, 15, 18 and 21-30 is/are pending in the application.
- 4a) Of the above claim(s) 9, 12, 15, 18 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The amendment and declarations filed June 8, 2009 are acknowledged and entered.

The Hiei declaration consisting of a total of 7 pages will hereinafter be known as Hiei declaration A. The Hiei declaration consisting of a total of 5 pages will hereinafter be known as Hiei declaration B.

The Hiei declaration A under 37 CFR 1.132 filed June 8, 2009 is insufficient to overcome the rejection of claims 22-30 based upon the rejection under 35 USC 103 as set forth in the last Office action because: Applicants have not shown any evidence that unexpected results occurred when centrifugation is carried out for up to 4 hours in Table 1. Furthermore the sample of tissue from the experiment was from rice and not from any plant material as claimed. In addition the centrifugal acceleration in Table 1 only demonstrates 1000G and 20,000G and not the broad range of up to 150,000G.

The Hiei declaration B under 37 CFR 1.132 filed June 8, 2009 is insufficient to overcome the rejection of claims 22-30 based upon 35 USC 103 as set forth in the last Office action because: Applicants have not shown any evidence that unexpected results occurred when centrifugal acceleration of up to 150,000G as claimed. Furthermore the experiment was performed only on rice and not the broad range of any plant as claimed.

Status of the Claims

Claims 1-8, 10-11, 13-14, 16-17, and 19-20 are cancelled; claims 9, 12, 15, 18, and 21 are withdrawn; claims 22-30 will be examined on the merits.

The rejection under 35 USC 112 (2nd paragraph) has been withdrawn due to Applicants' amendment to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22-30 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Konzak et al (U.S. Patent No. 6,362,393) in view of Lyznik et al (The Plant Journal (1995) 8(2), 177-186).

Konzak et al teach a method of centrifuging microspores (col. 4, lines 6-9) of rice or corn (also known as maize from the family *Gramineae*, a monocot and an angiosperm) (col. 6, lines 29-32) at the acceleration of 100G for 3 minutes (col. 16, line 1) prior to gene introduction. Microspore is defined as "male gametophyte of a plant, including all stages of development from meiosis through formation of the mature pollen grain, which is a plant tissue (col. 6, lines 19-21). Moreover, Konzak et al taught that gene transformation could occur at any time of the procedure (col. 4, lines 30-36) by using *Agrobacterium tumefaciens* (col. 12, lines 53-56).

Konzak et al do not teach the centrifugation speed of 1000G to 150,000G.

Lyznik et al teach that protoplasts were harvested in tubes pelleted by centrifugation for 5-10 sec at 1000 g, and suspended in GUS extraction buffer (page 183, col. 2, last paragraph).

It would have been obvious to one of ordinary skill in the art to use the method of promoting gene introduction into plant cells by centrifuging the plant cells or plant tissues before gene introduction by applying *Agrobacterium* as taught by Konzak et al, and to modify that method by adjusting the centrifugal acceleration as taught by Lyznik et al given the advantage of separating the tissues from the medium at higher speed. With regard to the use of protoplast as taught by Lyznik et al, one of ordinary skill in the art would have used plant tissue because if

the protoplast could withstand the high centrifugation speed then the plant tissue could also. One would have been motivated to do so, given the effectiveness of separating plant tissue by centrifugation. Furthermore, one of ordinary skill in the art would have a reasonable expectation of success in the combination of Konzak et al in view of Lyznik et al because the contacting step with *Agrobacterium* of plant cells or plant tissues simultaneously or after centrifugation would be a choice of experimental design and is considered within the purview of the cited prior art.

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had reasonable expectation of success in producing the claimed invention. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made as evidenced by the cited references.

Response to Arguments

Applicants' arguments filed June 8, 2009 have been fully considered but they are not persuasive.

Applicants argue that the cited references fail to describe the object of the present invention and do not recognize the problem which the present invention solves (response p. 7).

This argument is not found persuasive because the rejection is based on a combination of references Konzak in view of Lyznik. Konzak taught a method of centrifuging microspores, which is a plant tissue (col. 4, lines 6-9) of rice or corn and combined with Lyznik which taught centrifuging maize cells at 1000 g (p. 183). The object of the invention is a method of transforming a plant tissue with a desired gene. The claims do not limit to recognizing the problem which the present invention solves.

In response to applicants' argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicants rely (i.e., the problem which the present invention solves) are not recited in the rejected claim(s). Although the claims

are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicants argue that Konzak does not describe or suggest promoting the efficiency of gene transfer (response pp. 7-8).

This argument is not found persuasive because as stated above the claimed invention is a method of transforming a plant or plant tissue with a desired gene which has been taught by Konzak in view of Lyznik. The efficiency of promoting gene transfer is the result of centrifugation.

Applicants argue that Konzak presents no example showing the experimental data of gene transfer (response p. 8).

This argument is not found persuasive because the MPEP 2121 states, "When the references relied on expressly anticipates or makes obviousness all of the elements of the claimed invention, the reference is presumed to be operable. Once such a reference is found, the burden is on the applicant to provide facts rebutting the presumption of operability. *In re Sasse*, 629 F.2d 675, 207, USPQ 107 (CCPA) 1980. See also § 716.07."

Applicants argue that Lyznik fails to recognize the same object of the invention, that is, to promote the efficiency of gene transfer (response p. 8).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As stated above, Lyznik was combined with Konzak because Lyznik taught protoplasts were centrifuged at 1000 g (p. 183). Furthermore, the object of the invention is a method for transforming a plant or plant tissue with a desired gene.

Applicants argue that Lyznik fails to disclose the term "*Agrobacterium*," which is part of the instant invention (response p. 8).

In response to applicant's argument that the term "*Agrobacterium*" was not taught by Lyznik, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Moreover, Lyznik was combined with Konzak which taught that gene transformation may be by *Agrobacterium tumefaciens* (col. 12, lines 53-56).

Applicants argue that Lyznik taught that the centrifugation is carried out after gene transfer (response pp. 8-9).

This argument is not found persuasive because as stated above Lyznik was combined with Konzak to show that the centrifugation could be performed at a higher speed. The advantage of centrifuging is to separate the tissues from the medium. Konzak taught that microspores can be genetically transformed at anytime (col. 4, lines 30-34).

Applicants argue that the cited references when combined fail to describe the object of the instant invention (response p. 9).

This argument is not found persuasive because Konzak taught that the microspores were isolated by macerating the tissue and then subjecting the filtrate to density centrifugation (col. 4, lines 6-9). The microspores may be transformed by *Agrobacterium* (Konzak col. 12, lines 53-55). Konzak further taught that the microspores can be genetically transformed any time during the treatment of the microspores according to his methods (col. 4, lines 30-34). Moreover, claim 34 of Konzak taught that the microspores further comprise the step of

genetically transforming the microspores. Moreover, the microspores may be transformed by *Agrobacterium* as taught by Konzak. As stated above, Lyznik was combined with Konzak to show that the centrifugation may be at 1000 *g*.

Applicants argue that Konzak refers to the centrifugation as a step for isolating doubled haploid plants (response p. 9).

This argument is not found persuasive because Konzak taught the isolation of the microspores by centrifugation. The isolated microspores are cultured until embryoids develop into plants (abstract and col. 4, lines 6-36). The resulting plants may be haploid or doubled haploid and by be genetically transformed (abstract). Moreover, the microspores can be genetically transformed any time during the treatment (col. 4, lines 30-34).

Applicants argue that Lyznik teaches that the centrifugation is conducted after gene transfer which is a sharp contrast to the instant claims of "contacting step is carried out after or simultaneously to said centrifugation" (response p. 9).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As stated above the obviousness rejection is based on Konzak in view of Lyznik. Konzak taught that microspores may be genetically transformed any time during the treatment.

Applicants argue that all claim limitation must be considered in view of the cited prior art in order to establish a *prima facie* case of obviousness (MPEP 2143.03), which would include the contacting step that is carried out after or simultaneously to said centrifugation and Lyznik fails to teach or suggest the use or effects that would lead to the present invention (response p. 10).

This argument is not found persuasive because the rejection is based on a combination of references Konzak in view of Lyznik. All claim limitations have been considered. Konzak taught that microspores are isolated by density centrifugation and then the development of embryoids into plant which may be transformed anytime during the treatment according to his method (col. 4). Lyznik was combined with Konzak to teach that the centrifugal acceleration may be 1000G.

Applicants argue that the claim cites "wherein said centrifugation promotes efficiency of the transformation of the desired gene into said tissue or plant" and that the cited references do not describe this efficiency (response p. 10).

This argument is not found persuasive because the phrase "centrifugation promotes efficiency of transformation" is the result when centrifugation is applied.

Applicants argue that four *Graham* factors were not taken into account in the obviousness rejection (response p. 10).

This argument is not found persuasive because the four *Graham* factors were considered in the rejection. The scope and content of the prior art were taught by Konzak wherein microspores were isolated by centrifugation and that the genetic transformation may occurred any time. The difference between the Konzak and Lyznik was that Konzak did not teach the speed of the centrifugation. The level of one of ordinary skill in the art would have transformed the microspores after the centrifuge because the microspores would contain lesser amount of medium. Thus, centrifuging the microspores before the transformation would provide better contact of the *Agrobacterium* to the microspores. Finally, there would have been reasonable success in the combination of Konzak in view of Lyznik because the teachings of the cited references would be a choice of experimental design and is considered within the purview of the cited prior art.

Applicants argue that there was no rationale in determining obviousness, wherein the MPEP 2143 set forth some rationales that were established in the recent decision of *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (U.S. 2007) (response pp. 10-11).

This argument is not found persuasive because the Supreme Court in *KSR* stated that:

"When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at ___, 82 USPQ2d at 1396. The court also states "[t] obviousness analysis cannot be confined by overemphasis on the importance of published articles and the explicit content of issued patents.....In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends." *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396.

"A person of ordinary skill in the art is also a person of creativity, not an automaton." *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1397 (2007). "[I]n many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* Office personnel may also take into account "the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.* at ___, 82 USPQ2d at 1396.

Thus, it would have been obvious to one of ordinary skill in the art to combine the methods of Konzak in view of Lyznik.

Applicants argue that the cited references combined are based on the capabilities of the skilled artisan and that there is no proper reason or suggestion of improvement in the cited references. Moreover, the authors of the cited references are not aware of the problem which the present invention tries to solve (response p. 11).

This argument is not found persuasive because Konzak taught that the microspores are isolated by density centrifugation to form a pellet and Lyznik taught that the protoplasts were formed into a pellet by centrifuge at higher acceleration. It is well known in the art that centrifugation removes excess medium and the cells condense into a pellet. Konzak further taught that transformation can occur at any time. Thus, it would have been obvious to one of ordinary skill in the art to contact the tissue with *Agrobacterium* after or simultaneously to said centrifugation.

Applicants argue that the Hiei declaration filed on November 13, 2007 shows that there is a prominent difference between the "some GUS activity" with 760G and the GUS activities at 1000G or more which clearly show the effects of the present invention (response p. 12).

The Examiner agrees that the Hiei declaration 2007 demonstrated unexpected results, however, the claims do not commensurate in scope with the scope of the unexpected results because of the large range in types of plants as claimed and the large range in centrifugal acceleration and time as claimed. The MPEP 716.02(d) states, "objective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support." Thus, the unexpected results must occur over the entire claimed range and the Hiei Declaration 2007 does not cover the entire claim range.

Applicants argue that Hiei Declaration A shows that GUS expression is increased to twice to three times by a centrifugation of 1 second, 10 seconds or 60 seconds when compared to no centrifugation (response p. 13).

This argument is not found persuasive because Applicants have not shown any evidence that unexpected results occurred when centrifugation is carried out for 1 second to 4 hours. Furthermore the sample of tissue from the experiment was from rice and not from any other plant material as claimed, for example, groups of plants from gymnosperm or dicotyledon. Moreover, the centrifugal acceleration in Table 1 of Hiei declaration A only demonstrates 1000G and 20,000G. Furthermore, the evidence of nonobviousness does not provide support for the instant claims broad range of centrifugation of 1000G to 150,000G for 1 second to 4 hours. Objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support. See MPEP 716.02(d).

Applicants argue that Hiei Declaration B shows that centrifugation for 4 hours increased the gene transfer efficiency to the same degree by the centrifugation for 10 hours (Fig. 2, Table 1) (response p. 13).

This argument is not found persuasive because the data does not support the breadth of the claims. Table 1 shows centrifugal acceleration of 20,000G at 10 minutes and 4 hours; but the instant claims continue to recite 1000G to 150,000G for 1 second to 4 hours. Moreover, the plant tissue used in Table 1 was from rice and the instant claims cite a broad range of plants. Therefore, the limited showing of unexpected results is not sufficient to support the breadth of the instant claims.

Conclusion

No claims are allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to June Hwu whose telephone number is (571) 272-0977. The Examiner can normally be reached Monday through Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Anne Marie Grunberg, can be reached on (571) 272-0975. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/June Hwu/
Primary Examiner, Art Unit 1661